UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,674	04/14/2004	Sung-hee Lee	102-1024	4894

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/823,674	LEE ET AL.
	Examiner	Art Unit	
	ELISA M. RICE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *05 May 2009*.
2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-18,20 and 21* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1,3,7-10,15-18,20 and 21* is/are rejected.
7) ☒ Claim(s) *2-6 and 11-14* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's amendments filed on 5/5/2009 have been entered and received. Claims 1-

18, 20 and 21 are pending.

Response to Arguments

Applicant's arguments with respect to independent claims 1, 9, and 17 have been

considered. Applicant states that there is no mention of first and second interpolation

pixels and that there is no weighting according to relative locations. Choi discloses a

first and second interpolation pixel and this is addressed in the current Office Action as

discussed below. The weighting according to relative locations can be found in the

Heising reference at lines 15 to 21 of the left column, lines 29 to 34 and lines 35 to 36 of

the right column in page 95, lines 12 to 18 of the right column in page 99, the first

paragraph of the left column in page 100, Figure 2a, and formula 3 and 4. While Choi

teaches use OBMC, Heising explicitly discloses that the OBMC is used selectively

depending on the detected continuity of the blocks, thus avoiding the problem of

blurring. The Choi and Heising reference are both in the same field of endeavor of

block-based motion compensation systems and solve the same technical problem of

artifact reduction. As discussed in the last paragraph of page 100 of the Heising

reference, "switching between image warping model and the overlapped block motion

compensation allows to deal efficiently with the problem of motion discontinuities. Claim

2 contains subject matter which describes the role of the motion analyzer in the motion

compensation technique of claim 1, and which was not reasonably taught by the prior

art references and therefore objected to.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

Claims 9 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory

categories of invention. The Federal Circuit1[1], relying upon Supreme Court

precedent2[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be

tied to a particular machine or apparatus, or (2) transform a particular article to a

different state or thing. This is referred to as the "machine or transformation test",

whereby the recitation of a particular machine or transformation of an article must

impose meaningful limits on the claim's scope to impart patent-eligibility (See Benson,

409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed

process must not merely be insignificant extra-solution activity (See Flook, 437 U.S. at

590"). While the instant claim(s) recite a series of steps or acts to be performed, the

claim(s) neither transform an article nor are positively tied to a particular machine that

accomplishes the claimed method steps, and therefore do not qualify as a statutory

process.   That is, the method includes steps of extracting, retaining, comparing,

detecting, etc. is of sufficient breadth that it would be reasonably interpreted as a series

of steps completely performed mentally, verbally, or without a machine.   The cited

claims do not positively recite any structure within the body of the claim which ties the

claim to a statutory category.   Furthermore, the examiner suggests that the structure

needs to tie in the basic inventive concept of the application to a statutory category.

Structure that ties insignificant pre or post solution activity to a statutory category is not

sufficient in overcoming the 101 issue.

11] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

2   *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S.
63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 7-9, 15-17 and 18, 20, 21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Choi and Heising.

Regarding claims 1, 9, 17 and 18,

Choi discloses a block-based motion compensation apparatus comprising:: a first motion compensation interpolator to read a first and a second pixel corresponding to a motion vector of an estimated current block respectively from a current and a previous frame or field inputted, and to calculate a first interpolation pixel; at least one second motion compensation interpolator to read a third and a fourth pixel corresponding to a motion vector estimated with respect to each of at least one peripheral block adjacent to the current block to be interpolated respectively from the inputted current and previous frame or fields(Choi, page 606, left column, lines 8-16; equation 10), and to calculate a second interpolation pixel; a candidate interpolation pixel calculator to calculate a candidate interpolation pixel by allocating a predetermined weight to the first and the second interpolation pixels(Choi, equation 12 wherein the weight is 0.5); and a final interpolation pixel selector to select one among the first interpolation pixel and the candidate interpolation pixel as a final interpolation pixel, and to output the selected final interpolation pixel (Choi, page 606, paragraph 1 on the right-hand side; equation 11-13; Fig. 7; Choi, refer to lines 8 to 16 and formula 10 in the left column of page 606, the first paragraph and formulae 11 to 13 in the right column of the same page, and Figure 7).

Choi does not disclose a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the

second pixels are to be interpolated, and further comprising a motion analyzer, the final

interpolation pixel selector selects a final interpolation pixel according to the output

result of the motion analyzer.

However, Heising a candidate interpolation pixel calculator to allocate a weight to the

first and the second pixels according to relative locations where the first and the second

pixels are to be interpolated, and further comprising a motion analyzer, the final

interpolation pixel selector selects a final interpolation pixel according to the output

result of the motion analyzer (Heising, refer to lines 15 to 21 of the left column, lines 29

to 34 and lines 35 to 36 of the right column in page 95, lines 12 to 18 of the right column

in page 99, the first paragraph of the left column in page 100, Figure 2a, and formula 3

and 4).

Choi and Heising are both in the same field of endeavor of motion compensation

systems. It would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the invention of Choi to include a candidate interpolation pixel

calculator to allocate a weight to the first and the second pixels according to relative

locations where the first and the second pixels are to be interpolated, and further

comprising a motion analyzer, the final interpolation pixel selector selects a final

interpolation pixel according to the output result of the motion analyzer as taught by

Heising because, as is well known to a practitioner or ordinary skill in the art, the above

features perform identical functions in Choi for solving the artifact reduction problem

("significantly improving coding efficiency as well as visual quality", Heising, page 93,

first paragraph).

Regarding claims 7 and 15, the combination of Choi and Heising discloses the motion

compensation apparatus of claim 1, further comprising a delayer to delay the inputted

current frame or field for a predetermined time, and to provide the delayed frame or field

to the first and the second motion compensation interpolators and the motion

compensation part (Heising, Fig. 5, "delay")

Regarding claims 8 and 16, the combination of Choi and Heising discloses the motion

compensation apparatus of claim 1, wherein the number of the provided second motion

compensation interpolator is identical to the number of the peripheral blocks (Heising,

page 95, right-hand column, paragraph 5).

Regarding claim 20, the combination of Choi and Heising discloses the method of

claim 17, wherein the selecting of the discontinuous areas comprises analyzing a

deviation between motion vectors of a current block and peripheral blocks (Heising, see

formula 4; Heising, page 95, lines 29-37 on the right-hand side).

Regarding claim 21, the combination of Choi and Heising discloses the method of claim 17, further comprising selectively applying the overlap block motion compensation to non-selected areas of the image blocks to reduce blurring (Heising, lines 29 to 37 of the right column in page 95 and formula 4, page 96, paragraph 3 on the right-hand side).

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi and Heising as applied to claim 1, further in view of Ohm.

Regarding claim 2 and 10, while the combination of Choi and Heising discloses the motion compensation apparatus of claim 1, the combination of Choi and Heising does not disclose wherein the motion analyzer compares a deviation of the motion vectors of the current and the peripheral blocks, and when the deviation is equal to or larger than a preset threshold, outputs a signal to the final interpolation pixel selector indicating to select the candidate interpolation pixel calculated from the candidate interpolation pixel calculator as a final interpolation pixel, and when the deviation is smaller than the preset threshold, outputs a signal indicating to select the first interpolation pixel calculated from the first motion compensation interpolator as a final interpolation pixel.

Ohm teaches wherein the motion analyzer compares a deviation of the motion vectors of the current and the peripheral blocks, and when the deviation is equal to or larger than a preset threshold, outputs a signal to the final interpolation pixel selector

indicating to select the candidate interpolation pixel calculated from the candidate

interpolation pixel calculator as a final interpolation pixel, and when the deviation is

smaller than the preset threshold, outputs a signal indicating to select the first

interpolation pixel calculated from the first motion compensation interpolator as a final

interpolation pixel (Ohm, page 3, last six sentences of the left hand column to the first

five sentences of the right hand column).

It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify the invention of Choi and Heising to include the method of Ohm in order to

"overcome the inexact description of the motion vector field" by using an approach for

"taking into account features from the neighborhood" (Ohm, abstract) and more

specifically, to make use of the fact that "high differences of motion vectors usually

indicate the presence of an object border" as discussed starting at the 8th line up from

the bottom of the left hand column of page 3.

Claims 2-6 and corresponding claims 11-14 are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.

Regarding claims 3-6 and corresponding claims 11-14, none of the references of record

alone or in combination suggest or fairly teach the limitations contained therein.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to ELISA M. RICE whose telephone number is (571)270-

1582. The examiner can normally be reached on 12:00-8:30p.m. EST Monday thru

Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Brian Werner can be reached on (571)272-7401. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Reporesentative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elisa M Rice/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624